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SAYS PILES SHOULD REPLACE CAISSONS
IN THE BUILDING OF BRIDGE SUPPORTS

Supporters of the caisson method of bridge building try to insist that only caisson-built bridges can assure dependability and permanence. However, these persons ignore the more improved, progressive methods of building bridge supports on deep piles. The piles are large-diameter metal or ferroconcrete pipes driven into the ground to a great depth to a solid foundation and then filled solidly with concrete. Experience has shown that this method assures the necessary durability and permanence for the bridge support.

An example of the use of piles in bridge construction is the construction of five new supports for the large spans of a bridge being capitally repaired. The water was 5 to 9 meters deep. Calculations showed that the use of caissons to construct the supports would require not less than one year and a considerable quantity of materials and funds. The supports were constructed on metal piles. Under each support 120 metal piles were driven to a depth of 15-19 meters. One-third of the piles were sunk on an angle and the rest vertically. The piles were driven and filled with cement in the space of 5 months. The saving in construction materials and funds amounted to about 8 million rubles. Test of the piles showed their durability. Each of them supported a load of up to 150 tons. Ice movement and shocks against the support from ships did not cause any deformation.

On the construction of another large bridge being built by "Mostostroy" (Bridge-building), the pile method is being used to build a foundation for the supports. Four supports had to be built in the river. For each support it was necessary to drive 30 piles to a depth of 30 meters. All the piles for one support were driven in 10 days. The caisson method would have taken not less than 4-5 months. Tests of the piles conducted by the All-Union Scientific-Research Institute showed the high supporting capacity of the piles. Before being filled with concrete the pipes supported a load of up to 315 tons.

In another project, done by "Soyuztransproyekt" (All-Union Planning and Surveying Association of Ministry of Transportation USSR), one support built by the pile method was calculated to require 3,000 cubic meters of concrete (or 900 tons of cement), 2,000 cubic meters of lumber materials, 32,000 man-days,

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2.1 million rubles, and 3½ months less than if it were built by the caisson method. About 300 tons of metal pipe are used for one support, thus eliminating expenditures of 200 tons of fitting and structural iron which would be required by a caisson-built support. The volume of transportation of construction materials for the bridge would be reduced by 50 million ton-kilometers.

Up to the present the piles have been driven with powerful hammers. Recently, however, screw piles, which are screwed into the ground with capstans, have been used. The advantages of this method have been shown by operations of the All-Union Scientific-Research Institute and the Main Bridge-building Administration.

The Leningrad Office of "Transmostproyekt" (Transport Bridge Planning) has adopted the pile method in some of its projects.

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